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ATTORNEY DOCKET NO. **10020936-1**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Brett E. Bamesberger, et al.

Serial No.: 10/780,943 **Examiner:** Boris Leo Chervinsky

Filing Date: February 18, 2004 **Group Art Unit:** 2835

Title: LOW THERMAL STRESS COMPOSITE HEAT SINK ASSEMBLY

COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Sir:

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on October 18, 2006 .

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) **$500.00.**

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

☐ (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)(1)-(5)) for the total number of months checked below:

☐	one month	$ 120.00
☐	two months	$ 450.00
☐	three months	$1020.00
☐	four months	$1590.00

☐ The extension fee has already been filled in this application.

☒ (b) Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account **50-1078** the sum of $500.00 . At any time during the pendency of this application, please charge any fees required or credit any overpayment to Deposit Account **50-1078** pursuant to 37 CFR 1.25.

A duplicate copy of this transmittal letter is enclosed.

Respectfully submitted,

Brett E. Bamesberger, et al.

By James A. Sheridan

James A. Sheridan
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Date: December 15, 2006

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☒ I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Appl. No.	:	10/780,943 Confirmation No. 2288
Appellant	:	Brett E. Bamesberger et al.
Filed	:	February 18, 2004
TC/A.U.	:	2835
Examiner	:	Boris Leo Chervinsky
Docket No.	:	10020936-1

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

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APPEAL BRIEF

This Appeal Brief is submitted in response to the Final Office Action mailed August 28, 2006.

Appellant filed a Notice of Appeal on October 18, 2006.

Real Party in Interest

The real party in interest is Agilent Technologies, Inc., assignee of the above captioned patent application. Agilent Technologies, Inc. is a Delaware Corporation having its principal place of business in Palo Alto, California.

Related Appeals and Interferences

There are no related appeals and/or interferences.

Status of Claims

Claims 20-30 are pending in this application. Claims 20-30 currently stand rejected.

A copy of the claims is attached as a Claims Appendix to this Appeal Brief.

Status of Amendments

No amendments were filed or entered subsequent to the final office action mailed on August 28, 2006

Summary of Claimed Subject Matter

The invention is variously embodied. Claim 20 is summarized below.

In claim 20, apparatus comprises a heat sink device (FIGS. 1 and 4-6; 100, 200, 300, 400; p. 6, line 11 to p. 8, line 10; p. 8, lines 18-29; p. 8, line 31 to p. 9, line 2; and p. 9, lines 4-7) for dissipating heat from one or more electronic components (FIGS. 2 and 3; 150; p. 6, lines 28-30; p. 7, lines 6-11) having a CTE, the heat sink device comprising a heat-dissipating substrate (FIGS. 1 and 4-6; 110, 210, 310, 410; p. 6, lines 12-18; p. 8, lines 18 and 19; p. 8, lines 31-33; p. 9, lines 4-7) having one or more apertures and a CTE; one or more heat-dissipating cores (FIGS. 1,4-6; 120, 220, 320, 420; p. 6, lines 18-25, p. 8, lines 18 and 19; p. 8, lines 31-33; p. 9, lines 4-7) within said one or more apertures in the heat-dissipating substrate so as to permit the one or more electronic components to be attached to individual ones of the one or more heat-dissipating cores in the heat-dissipating substrate, and the one or more heat-dissipating cores comprising a material with a CTE between the CTE of the individual one or more electronic components ~~is~~ attached thereto and the CTE of the heat-dissipating substrate; and one or more thin, complaint elastomeric layers (p. 8, lines 5-10) between the one or more heat-dissipating cores and the heat-dissipating substrate for isolating the heat-dissipating substrate and the one or more heat-dissipating cores from one another.

Ground of rejection to be reviewed on appeal

1. Whether claims 20-30 should be rejected under 35 U.S.C. 103(a) as being unpatentable over Krassowski et al. (U.S. Patent No. 6,758,263; hereinafter referred to as "Krassowski") in view of Mishima et al. (Japanese Publication No. JP8186204A; hereinafter referred to as "Mishima").

Argument

1. Whether claims 20-30 should be rejected under 35 U.S.C. 103(a) as being unpatentable over Krassowski et al. (U.S. Patent No. 6,758,263; hereinafter referred to as "Krassowski") in view of Mishima et al. (Japanese Publication No. JP8186204A; hereinafter referred to as "Mishima").

Claim 20

Independent claim 20 calls for a heat sink device comprising one or more thin, complaint ***elastomeric layers*** between one or more heat-dissipating cores and a heat-dissipating substrate for isolating the heat-dissipating substrate and the one or more heat-dissipating cores from one another.

Appellants believe that Krassowski discloses a heat spreader 14 which includes an anisotropic graphite planar element 16 having a relatively high thermal conductivity in the plane of the planar element 16 along dimensions x and y and having a relatively low thermal conductivity across a thickness 18 of the planar element in a direction z normal to the plane defined by dimensions x and y. Appellants believe that Krassowski discloses a core or insert 22 received in the cavity 20 of the heat spreader 12. However, Krassowski does not appear to teach or suggest a heat sink device with one or more thin, complaint elastomeric layers between the one or more heat-dissipating cores and the heat-dissipating substrate for isolating the heat-dissipating substrate and the one or more heat-dissipating cores from one another. As discussed below, Krassowski also does not appear to teach or suggest a feature of "the thin compliant layer isolating the heat-dissipating substrate and the stud" as stated by the Examiner.

Appellants believe that Mishima teaches away from the present invention of claim 20 in that the "mounting member and heat dissipation part are coupled directly with each other." (See the Abstract of Mishima in the English language.)

In the Office action of August 28, 2006, on pages 2 and 3, the Examiner provides his reasoning for the rejection of claims 20-30 as follows:

> "2. Claims 20-30 are rejected under 35 U.S.C. 103(a), as best understood, as being unpatentable over Krassowski et al. Pat. 6,758,263 in view of Mishima et al. Krassowski discloses a heat sink 12 for dissipating heat from the component 14 comprising: a heat dissipating substrate 16 having an aperture 20 extending from a first side to a second side, a heat dissipating stud 22 made of metal (col. 11, lines 22-30) attached within the aperture 20; the aperture is cylindrical or can be of any shape (col. 11, lines 51-55), the thin compliant layer isolating the heat-dissipating substrate and the stud, the surface of the stud or the aperture can be plated, the fins 36 are also disclosed. Krassowski discloses the claimed invention except the stud material having the CTE close to the CTE of the electronic component or intermediate between the CTE of the component and the heat dissipating substrate. Mishima discloses the heat sink with the inserted stud with the CTE close to the CTE of the electronic component or intermediate between the CTE of the component and the heat dissipating substrate. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to choose the property of the materials as disclosed by Mishima in the structure disclosed by Krassowski et al. in order to provide optimum heat dissipation and integrity of the structure." (Underlining added.)

In the section identified as "Response to Arguments" on page 3 of the Office action of August 28, 2006, the Examiner states:

> Applicant's arguments filed 06/02/06 have been fully considered bu thtey are not persuasive. Krassowski in fact discloses ***the complaint elastomeric layer between the heat dissipating core and the substrate*** (see col. 14, lines 31-34) as indicated above, and Mishima indicates: ... a heat sink of good heat dissipation property wherein thermal expansion difference is little between it and a semiconductor element. It also must be noted that the limitation in claim 20 regarding ***the physical properties of the materials, specifically CTE, does not provide structural difference between the claimed device and the device disclosed by Krassowski*** and is related to a material choice, therefore would have been obvious since it has been held to be within the general skill of a worker in the at to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.
>
> (Emphasis added.)

Krassowski does not disclose the feature of "the thin compliant layer isolating the heat-dissipating substrate and the stud" or the feature of "the complaint elastomeric layer between the heat dissipating core and the substrate" as indicated by the Examiner in the Office action of August 28, 2006 and reproduced hereinabove. Krassowski, at col. 14, lines 31-34, discloses a thin layer of thermal grease or phase change material or other lubricant... coated onto the insert or on the inside of the cavity prior to inserting the insert. None of these are an elastomeric layer. As such, Appellants assert that the Examiner has failed to make a *prima facie* case that claim 20 is unpatentable over Krassowski in view of Mishima et al.

Furthermore, Appellants note that the Examiner indicates that "the surface of the stud or the aperture can be plated, the fins 36 are also disclosed." Appellants have previously requested clarification of the significance of these features, especially if the Examiner asserts that these features relate to the claimed feature of one or more thin, complaint elastomeric layers between the one or more heat-dissipating cores and the heat-dissipating substrate for isolating the heat-dissipating substrate and the one or more heat-dissipating cores from one another. No clarification has been offered by the Examiner.

In addition, the Examiner indicated that ***the physical properties of the materials, specifically CTE, does not provide structural difference between the claimed device and the device disclosed by Krassowski.*** Applicants respectfully disagree. The physical properties of the materials, which specific CTE relationships, provide structural advantages in the present invention, and this limitation is not disclosed by Krassowski.

Neither Krassowski nor Mishima teach or suggest a heat sink device having one or more thin, complaint elastomeric layers between one or more heat-dissipating cores and a heat-dissipating substrate for isolating the heat-dissipating substrate and the one or more heat-dissipating cores from one another. Accordingly, claim 20 is believed to be allowable.

Claims 21-30

Claims 21-30, which depend directly from independent claim 20, are believed to be allowable for at least the above-identified reasons.

2. Conclusion

In summary, the art of record does not teach nor suggest the subject matter of Appellants' claims 20-30. These claims are therefore believed to be allowable.

Respectfully submitted,
Holland & Hart LLP

Date: December 15, 2006 By: James A. Sheridan

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Claims Appendix

Claim 20: A heat sink device for dissipating heat from one or more electronic components having a CTE, the heat sink device comprising:

a heat-dissipating substrate having one or more apertures and a CTE;

one or more heat-dissipating cores within said one or more apertures in the heat-dissipating substrate so as to permit the one or more electronic components to be attached to individual ones of the one or more heat-dissipating cores in the heat-dissipating substrate, and the one or more heat-dissipating cores comprising a material with a CTE between the CTE of the individual one or more electronic components attached thereto and the CTE of the heat-dissipating substrate; and

one or more thin, complaint elastomeric layers between the one or more heat-dissipating cores and the heat-dissipating substrate for isolating the heat-dissipating substrate and the one or more heat-dissipating cores from one another.

Claim 21:The heat sink device in accordance with claim 20, wherein the one or more apertures in the heat-dissipating substrate extends from a first side to a second side of the heat-dissipating substrate.

Claim 22: (Previously presented) The heat sink device in accordance with claim 20, wherein the one or more apertures in the heat-dissipating substrate is cylindrical.

Claim 23: (Previously presented) The heat sink device in accordance with claim 20, wherein the one or more apertures in the heat-dissipating substrate is pyramidal.

Claim 24: (Previously presented) The heat sink device in accordance with claim 20, wherein the one or more apertures in the heat-dissipating substrate is conical.

Claim 25: (Previously presented) The heat sink device in accordance with claim 20, wherein the one or more apertures in the heat-dissipating substrate is stepped.

Claim 26: (Previously presented) The heat sink device in accordance with claim 20, wherein the heat-dissipating substrate and the one or more heat dissipating cores are electrically isolated from one another by the thin compliant elastomeric layer.

Claim 27: (Previously presented) The sink device in accordance with claim 20, wherein the thin compliant elastomeric layer absorbs CTE mismatch between the one or more heat-dissipating cores and the heat-dissipating substrate.

Claim 28: (Previously presented) The heat sink device in accordance with claim 20, wherein the thin compliant elastomeric layer absorbs movement of the one or more heat-dissipating cores relative to the heat-dissipating substrate.

Claim 29: (Previously presented) The heat sink device in accordance with claim 20, wherein the one or more heat-dissipating cores may be selectively plated to isolate the one or more heat-dissipating cores from the heat-dissipating substrate.

Claim 30: (Previously presented) The heat sink device in accordance with claim 20, wherein the one or more apertures in the heat-dissipating substrate may be selectively plated to isolate the heat-dissipating substrate from the one or more heat-dissipating cores.

Evidence Appendix

No extrinsic evidence was relied upon to support the arguments herein.

Related Proceedings Appendix

Appellants are unaware of any Board or court proceedings related to this Application.